

1. TUL'ZHENKOVA, F. F.
2. USSR (600)
4. Vegetable Gardening - Arctic Regions
7. Vegetable gardening in the Arctic. Sad i og. no. 11, 1952
  
  
  
  
  
  
  
  
  
  
9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

TUL'ZHENKOVA, T. F.

24532 Byrashchivaniye ogurtsov i luka vo mkhu. Sad i ogorod, 1949, No. 8, c. 65-67

SO: LETOPIS' NO. 35, 1949

TUM, Petr Pavlovich, kapitan dal'nego plavaniya; MATYUSHINA, S.P.,  
red.; TIKHONOVA, Ye.A., tekhn.red.

[Aral Sea; navigational-geographical and hydrometeorological  
studies] Aral'skoe more; navigatsionno-geograficheskii i  
gidrometeorologicheskii ocherki. Moskva, Izd-vo "Morskoi  
transport," 1960. 40 p.  
(Aral Sea) (MIRA 13:10)

TUM, P.

Poultry - Feeding and Feeding Stuffs

Salt in increasing productivity of ducks and chickens. Sots. zhiv. 14 no. 8, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. UNCLASSIFIED.

TUMA, A.

Auto accessories at the Paris automobile exhibition

P. 175 (Motoristicka Soucasnost) Vol. 3, No. 2, May 1957, Czechoslovakia

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC. - VOL. 7, NO. 1, JAN. 1958

TUMA, A.

Autumn congresses of international of motorists organizations. p. 713.  
(SVET MOTORU, Vol. 10, No. 23, Nov 1956, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 12, Dec 1957. Uncl.

TUMA, A.

Workshops of the League for Cooperation with the Army.

P. 21. (SVET MOTORU.) (Praha, Czechoslovakia) Vol. 12, No. 1, Jan. 1958

SO: Monthly Index of East European Accession (LEAI) LC. Vol. 7, No. 5, 1958

Tuma, A.

"Tragedy on the highways." p.379

SVET MOTORU. (Svaz pro spolupraci s armadou) Praha, Czechoslovakia, Vol. 13,  
no. 12, June 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, No. 9, Sept. 1959  
Uncl.



TUMA, A.

"In the streets of Prague."

p. 58 (Svet Motoru) Vol. 12, no. 2, Jan. 1958  
Prague, Czechoslovakia

SO: Monthly Index of East European Accessions (MEAI) LC. V61. 7, no. 4,  
April 1958

TUMA, A.

Shall we have reflective traffic signs? p. 219.

SVET MOTORU. (Svaz pro spolupraci s armadou)  
Praha, Czechoslovakia  
Vol. 13, no. 7, Mar. 1959

Monthly list of East European Accessions (EEAI), LC, Vol. 8, no. 7  
July 1959  
Uncl.

TUMA, A.

Our first congress. p. 161. (Svet Motoru. Praha. Vol 10, no. 6, Mar. 1956.)

SO: Monthly List of East European Accessions (EEAL) LC., Vol. 6, no. 7, July 1957. Uncl.

Tuma, A.

Tuma, A. For development of motorism. p. 257.

Vol. 10, no. 9, Apr. 1956  
SVET MOTORU  
TECHNOLOGY  
Czechoslovakia

So: East European Accessions, Vol. 6, May 1957  
No. 5

TEMA, A.

Motor sport for everybody. p. 321.  
OVB' MOTOM, Praha, Vol. 9, no. 11, May 1955.

30: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955,  
Uncl.

TUNA, A.

Preparations for the 30th Annual International Six-Day Motorcycle Race,  
September 13-18. p. 362.  
SVET MOTORU, Praha, Vol. 9, no. 12, June 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955,  
Uncl.

TUMA, A.

Let us prepare well for the Six-Day Race. p. 417.  
Strikes in American automobile factories. Tr. from the Russian. p. 418.  
Catastrophe in Le Mans. p. 418.  
SVET MOTORU, Praha, Vol. 9, no. 14, July 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955,  
Uncl.

TUMA, A.

"Czechoslovak Victory in England at the 16th Six-Day Race. Tr. from the Czech", P. 16. (AUTO MOTOR, Vol. 7, No. 20, Oct. 1954, Budapest, Hungary)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 1, Jan. 1955, Uncl.



TUMA, A.

"The Africa of Hanzelka and Tuma." p. 30 (Svet Motoru, Vol. 7, no. 137, Jan. 1953, Praha)

SO: Monthly List of East European Accessions, Vol. 3, no. 2, Library of Congress, Feb. 1954, Uncl.

SRACKOVA, D.; TEYSCHL, O.; TUMA, A.

Value of the determination of bilirubin fractions in icterus neonatorum. Cesk. pediat. 20 no.10:849-854 O '65.

1. II. detska klinika lekarske fakulty University J.E. Purkyne v Brne (prednosta prof. dr. M. Toman) a Ustredni laborator Fakultni detske nemocnice v Brne (vedouci MUDr. O. Teyschl).

TUMA, ADOLF.

Tuma, Adolf, Od kočaru k automobilu; 50 let automobilky Tatra v Kopřivnici.  
(V Praze, Tatra, 1947) 1v. (unpaged) (From the carriage to the automobile; 50 yrs.  
of the Tatra Automobile Plant in Koprivnice. English and French, German, and  
Russian summaries. illus.)

SO: Monthly List Of East European Accessions, LC. Vol.3, No. 5 May 1954, Unclassified

TUMA, B.

Let us attain higher efficiency in handling heavy building machinery.

P. 189 (Mechanisace) Vol 4, No. 6, June, 1957, Czechoslovakia

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC. - VOL. 7, NO. 1, JAN. 1958

TUMA, B.

Cholevik. Deficiencies of dynamo starters of the DKW and JAWA vehicles. p. 205.  
SVET MOTORU, Praha, Vol. 9, no. 7, Mar. 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955,  
Uncl.

TOMSA, Antonin, inz.; TUMA, C.O., inz.

General amplifier for measuring and recording of vibrations. Letecky  
obzor 6 no.3:90-91 '62.

Z/040/62/000/003/003/003  
D006/D102

AUTHORS: Tomsa, Ant., Engineer, and Tuma, C. O., Engineer

TITLE: Universal amplifier for vibration measuring and recording

✓ PERIODICAL: Letecký obzor, no. 3, 1962, 90

TEXT: The article presents a description of a universal amplifier with an input resistance of  $2\text{ M}\Omega$  and four outputs for a pointer meter, a recorder, a cathode-ray oscilloscope and a loop oscillograph, respectively. It can be used for measuring vibrations of engines and machines, for dynamic stress measurements using strain gauges, or as a high-sensitivity amplifier for various other low, alternating voltages. The amplifier sensitivity is such that vibration amplitudes as low as  $1\mu$  can be determined and registered. The instrument is a low-frequency, three-stage amplifier with a filter suppressing frequencies below 50 cps, four cathode followers, and a built-in pointer meter. Its total gain is  $10^3$ . The input sensitivity can be varied from 5 to 500 mV in seven steps. The instrument has a built-in voltage stabilizer permitting its plugging into a 220 V, 50 cps

Card 1/2

Universal amplifier ...

Z/040/62/000/003/003/003  
D006/D102

line with  $\pm 10\%$  deviation. Some of these amplifiers already are in operation at the ZJS in Prague-Jinonice, and the Rukov - sdružený podnik okresu Děčín, závod 122 Varnsdorf (Rukov - Associated Enterprise of the Děčín District, plant 122, Varnsdorf) will produce a larger number of these amplifiers. There are 4 figures.

Card 2/2



TIMA, F.  
VAVRIN, F.

Quick-hardening cement. p. 76.

STAVIVO. (Ministerstvo stavebnictví) Praha, Czechoslovakia, Vol. 37,  
no. 3, Mar. 1959.

Monthly list of East European Accessions (EEAI), LC, Vol. 8, no. 7,  
July 1959 uncla.

TOMEK, Jiri, inz., ScC.; TUMA, Frantisek

Mortars and grouts for panel assembling under low temperature.  
Poz stavby 11 no.5:264-267 '63.

1. Vyzkumny ustav stavebni, Gottwaldov.

precipitation of the carbides, were investigated metallographically (by optical

"APPROVED FOR RELEASE: 03/14/2001

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**APPROVED FOR RELEASE: 03/14/2001**

**CIA-RDP86-00513R001757420007-8"**

VYKLITSKIY, M.; KRALIK, F.; TUMA, G.

Distribution of elements in the  $\alpha$  - and  $\gamma$  -phases of chromium  
nickel austenitic and ferritic steels. Avtom. svar. 17 no.2:3-  
37 F '64. (MIRA 17:9)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut materialov  
i tekhnologii Akademii nauk Chexoslovatskoy Sotsialisticheskoy  
Respubliki.

z/0065/64/000/001/0013/0027

ACCESSION NR: AP4017926

AUTHOR: Vyklicky, Miloslav (Vy\*klitskiy, Miloslav); Kralik, Frantisek (Kralik, Frantisek); Tuma, Hanus (Tuma, Ganush)

TITLE: Distribution of the elements between the alpha and gamma phases in chromium-nickel steels with two-phase structure

SOURCE: Kovove materialy, no. 1, 1964, 13-27

TOPIC TAGS: element distribution, alpha phase, gamma phase, chromium-nickel steel, two-phase structure, manganese

ABSTRACT: The paper studies with a KAMEKA micro-probe the distribution of manganese chromium and nickel in ferrite and austenite in two-phase chromium-nickel steels with a content of about 0.1% C, 21% Cr, 0.5--9.8% Mn, 3.1--6.6% Ni, some of which were further alloyed with about 2% Mo and 0.3% Ti. It was found that the distribution factor in the range of chemical composition studied is approximately constant; about 1.2 for chromium, and 0.9 for manganese. For nickel, this factor depends upon its content in the alloy and varies from 0.55 to 0.65 in the range studied. The heat of solution was found to be about +500 cal/mol for chromium, about -300

Card

1/12

ACCESSION NR: AP4017926

for manganese and from -1,000 to -1,500 for nickel, depending on the nickel content. The data determined for chromium and nickel agreed well with those cited in the literature. The value of -2,040 cal/mol given for manganese in the literature is based on balanced binary Fe-Mn diagrams, where the breakdown of the manganese into alpha and gamma phases is determined indirectly (dilatometrically, metallographically, etc.), and conflicts with all practical experience thus far gained. The paper also shows that in the alloys studied the heat of solution depends on the temperature, which contradicts Zener (Transactions of the Am. Inst. of Mining and Metall. Engineers, 167, 1946) and Jones and Pumphrey (J. Iron and Steel Inst., 163, 1949), who derived the equation for the heat of solution under the assumption that its distribution does not depend either on the temperature or on the concentration of the alloy elements. The authors could not decide from their experiments whether this disagreement was due to the higher concentration of the alloy elements in the specimens or whether that assumption was unjustified. Original has 6 tables, 8 graphs, and 2 equations.

ASSOCIATION: Statni vyskumny ustav materialu a technologie, Prague (State Experimental Establishment for Material and Technology); Laboratorium fyziky kovov SAV, Bratislava (Laboratory for the Physics of Metals of the SAV)

Card 2/32



ACCESSION NR: AP4042272

Z/0032/64/014/007/0509/0517

AUTHOR: Vyklicky, M.(Engineer); Mericka, M., Kabrhal, A. (Engineer); Tuma, H., (Engineer); Kopal, V.(Engineer); Mursec, M.(Engineer); Dvorak, R.(Engineer); Valtr, V.

TITLE: Corrosion resistance of steel with a two-phase structure of the type Cr21Ni5

SOURCE: Strojirenstvi, v. 14, no. 7, 1964, 509-517

TOPIC TAGS: chromium steel, nickel steel, stainless steel, corrosion resistance, phase structure, alloy steel, alloying, phosphorus, titanium

ABSTRACT: Extensive experiments have been carried out to test corrosion resistance of newly introduced non-rusting steels with a two-phase structure of the type Cr21Ni5, which are mainly utilized in equipment of the chemical industry. The tests were carried out in the laboratory and confirmed by experiments in industrial plants, and included comparisons with classical steels which the new types

Card 1/5

ACCESSION NR: AP4042272

were to replace. Laboratory tests of the usual type were carried out on 30 x 80 x 2 mm (and also 1 mm) samples and plant tests on 20 x x 100 x 2 mm samples. The results of the experiments are in agreement with corrosion theory. Increased phosphorus content lowers the corrosion resistance. The varying effect of titanium added to Cr21Ni5 and Cr18Ni9 in different acids is discussed. In general it is found that the optimal types of two-phase steels have a corrosion resistance similar to that of classical austenite steel while being more economical than the corrosion resistant CSN 17460 and 17471 steels, and exhibiting a much higher intercrystalline-corrosion resistance. It was found that in the food-processing industry Cr21Ni5Ti can almost fully replace CSN 17246 steel. Orig. art. has: 6 figures and 13 tables.

ASSOCIATION: SVUMT, Prague

SUBMITTED: 00

ENCL: 03

SUB CODE: MM

NR REF SOV: 001

OTHER: 006

Card 2/5

ACCESSION NR: AP4042272

ENCLOSURE: 01

Ocel 1	ČSN 17334 Cr21Ni10Ti			ČSN 42 2053 Cr21Ni10	ČSN 42 2038 Cr21Ni10Ti	ČSN 42 2043 Cr21Ni10Mo2
vyrobek 2	Plechy 3	Tyče 4	Výkovky 5	Odličky 6	Odličky	Odličky
$\sigma_{KI}$ [kp/mm <sup>2</sup> ] min.	40	38	38	35	35	35
$\sigma_{PI}$ [kp/mm <sup>2</sup> ]	65—90	65—90	65—90	68—90	65—90	65—90
$\delta_5$ [%] min.	23	20	20	18	12	18
$\varphi$ [%] min.	35	35	35	15	10	15
$R$ [mkp/cm <sup>2</sup> ] min.	8	8	8	4	2	4
Tvrdość HB 7	—	—	—	180—250	180—250	180—250

Card 3/5

ACCESSION NR: AP4042272

ENCLOSURE: 02

Svařitelnost 8	zaručená 14	zaručená	zaručená	zaručená
Doporučované elektrody 9	E 380	E 388 E 389	E 389	E 300 E 301
Teplotné zpracování 10	980—1020 °C	1000—1050 °C	980—1020 °C	980—1020 °C
Teplota použití (maximální) 11	250 °C	300 °C	300 °C	300 °C
Nahrazovaná ocel ČSN 12	17246	422031 422032	422033	422042
Obrobitelnost 13	dobrá 15	dobrá	dobrá	dobrá

Card 4/5

ACCESSION NR: AP4042272

ENCLOSURE: 03

Legend for Enc. 01: 1 - steel, 2 - article, 3 - plate, 4 - rod, 5 - forging, 6 - casing, 7 - hardness, 8 - weldability, 9 - electrodes used, 10 - heat treatment, 11 - maximum operating temperature, 12 - replaces CSN steel, 13 - workability, 14 - guaranteed, 15 - good

\*With suggested quenching in water or air. Steels with two-phase structure are more workable than conventional pure austenitic steels.

Card 5/5

PHASE I BOOK EXPLOITATION

JUN 25 1962 42

*TUM A, H.*  
Jerle, Jan, ed., Engineer, Doctor, Corresponding Member of the Czechoslovak Academy of Sciences

Základní problémy ve stavbě spalovacích turbin (Basic Problems in the Construction of Gas Turbines [collection of articles]). Prague, Nakl. CAV, 1962. 627 p. 1600 copies printed.

Sponsoring Agency: Československá akademie věd.

Ed. of Publishing House: Marie Moravcová; Tech. Ed.: František Končícký.

PURPOSE: The book is intended to familiarize turbine designers with recent developments in the design of gas turbines and to present some research results which may be helpful in designing more efficient turbines.

COVERAGE: The book comprises articles by leading Czechoslovak turbine experts on thermodynamic cycles, flow research in turbine components.

Card 1/8

Basic Problems in the Construction (Cont.) z/6284

J. Vosodálek (State Research Institute for Materials and Technology, Prague). Requirements for Construction Materials of the Principal Turbine Components 183

L. Čížek and M. Vystyd (State Research Institute for Materials and Technology, Prague). Current State and Development of Heat-Resistant Materials for Gas Turbines 199

L. Čížek. Prospective Materials for Use in Gas Turbine Construction 211

Z. Eminger (V. I. Lenin Plant, Plzeň) and J. Krumpos (State Research Institute for Materials and Technology, Prague). The Austenitic Alloy "LZ" 221

N. Vystyd, J. Ježek, and H. Tuma (State Research Institute for Materials and Technology, Prague). The Relationship between the Microstructure and the Properties of Some Heat-Resistant Steels and Alloys 233

Card 4/8

TUMA, H.

Isolation of carbides from steels and similar alloys. p.909.

CHEMICKE LISTY (Chemoslovenska akademik ved. Chemoslovensks  
spotlcnost chemicks) Paraha, Czechoslovakis. Vol.53,no.9, Sept.1959.

Monthly List of East European Accessions (EEAI) LC, Vol.9, no.1, Jan.1960.

Uncl.



✓ The structure of the

7

COUNTRY	:	Czechoslovakia	B-8
CATEGORY	:		
ABS. JOUR.	:	RZKhim., No. 21 1959, No.	74215
AUTHOR	:	Tykhlov, M. and Tuma, H.	
ISS.	:	Not given	
TITLE	:	Crystallization of Commercial Fe-Al-C Alloys in the $\alpha$ -Solid Solution Region	
ORIG. PUB.	:	Hutnicki Listy, 14, No 2, 118-127 (1959)	
ABSTRACT	:	<p>Differential thermal analysis and metallographic analysis were used in the investigation of the phase diagram of the system Fe-Al-C in the region 15-30% Al. <math>\alpha</math>-solid solution was found throughout the temperature range investigated, and in the presence of C the <math>\epsilon</math>-phase, graphite, and <math>Al_4C_3</math> were also observed.</p> <p style="text-align: right;">From authors' summary</p>	

CARD: 1/1

COUNTRY : Czechoslovakia E-2  
 CATEGORY :  
 ABS. JOUR. : RZKhim., No. 1959, No. 86228  
 AUTHOR : Dufek, O.; Tuma, H.  
 INST. :  
 TITLE : Rapid Concurrent Potentiometric Determination  
 of Chromium, Vanadium and Iron in Carbides  
 by Means of Trivalent Titanium Chloride.  
 ORIG. PUB. : Hutn. listy, 1959, 14, No 3, 246-247  
 ABSTRACT : It was found that on potentiometric titration  
 of a mixture of Cr(6+), V(5+), Mo(6+) and Fe(3+) with  $TiCl_3$   
 solution, in a medium of  $HClO_4$  and  $HCl$ , the 1st jump of  
 potential corresponds to reduction of Cr(6+) to Cr(3+) and  
 of V(5+) to V(4+), the 2nd -- to conversion of Fe(3+) to  
 Fe(2+), and the 3rd -- to conversion of Mo(6+) to Mo(5+).  
 In the presence of Na-tartrate or citrate there is observed  
 also a 4th jump of potential corresponding to conversion of  
 V(4+) to V(3+). On analysis of carbides isolated from steel,  
 10-50 mg sample is dissolved in 3-5 ml (0%  $HClO_4$ , evaporated  
 with several drops concentrated  $HNO_3$  to evolution of dense  
 fumes (0.5 hour), residue combined with several drops of  
 CARD: 1/2

COUNTRY : Czechoslovakia E-2  
CATEGORY :  
ABS. JOUR. : RZKhim., No. 1959, No. 86228  
AUTHOR :  
INST. :  
TITLE :  
ORIG. PUB. :

ABSTRACT : water, added 15 ml concentrated HCl, and titrated with with 0.005 N solution  $\text{TiCl}_3$ . After titration of Cr(6+), V(5+), Fe(3+) and Mo(6+), there are added to the same solution 40 ml of 40% solution of Na-citrate and titration is continued to the jump of potential corresponding to V. From the difference between the number of ml of  $\text{TiCl}_3$  solution used up to get the 1st jump of the potential (Cr+V) and the last jump of potential (V), the content of Cr is determined. -- N. Turkevich.

CARD: 2/2

113

TUMA, H.

Distr: 4E2c

✓ The separation of carbides and borides from nonferrous boron-alloyed hard-facing materials. Hanuš Tuma and Karel Löbl. *Materialový Sborník* 1958, 93-104 (Pub. 1959).

Alloys of Ni-Cr with B 3.15% and of Co-Cr-W with B 1.44% (stellite-type alloys) were investigated. A suitable electrolyte for isolating the carbides and borides contains mono-Na citrate 5% and NaCl 2.5%. During electrolysis, the temp. should not exceed 5°, the time not over 2 hrs., at 0.02 amp./sq. cm. and 4 v. In 5% HCl, a larger quantity of B will be dissolved: the borides present in these alloys are not as acid-resisting as indicated by others. Therefore, when isolating borides, it is recommended to proceed with the same caution as in the case of isolating other structural parts.

F. H. Lieben—

Tuma, H.

Structural stability of coating alloys for seating surfaces  
of high-pressure fittings K. Loh, J. Jozek, and H. Tuma  
(Stealth des Forschungsinst. Material, Carl Zeiss, Jena)

1. Introduction  
2. Experimental  
3. Results  
4. Discussion  
5. Conclusion  
6. References

17/2

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TUMA, H.

Importance of ascorbic acid in analytical chemistry.

p. 390 (Chemie, Vol. 9, no. 3, June 1957, Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC. VOL. 7, no. 2,  
February 1958

TUMA, H.; TOMAN, V.

Methods of evaluating spectro-photometric measurements in a simultaneous determination of two or more components of a solution. p. 621. (MUTHICKE LISTY, Vol. 12, No. 7, July 1957, Brno, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 12, Dec 1957. Uncl.

TUMA, H.

Photocolorimetric determination of zirconium with morin.

p. 722 (CHEMICKÉ LISTY) Vol. 51, no. 4, Apr. 1957,  
Praha, Czechoslovakia

SO: Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 3,  
March 1958

Tuma, H.

Titrimetric determination of higher aluminum content in iron alloys.  
p. 98. HUTNICKE LISTY. (Ministerstvo hutního průmyslu a rudných  
dolu) Brno. Vol. 11, no. 2, Feb. 1956.

Source: EEAL LC Vol. 5, No. 10 Oct. 1956

TUMA, H.; TIETZ, N.

SCIENCE

Periodical COLLECTION OF CZECHOSLOVAK CHEMICAL COMMUNICATIONS. SBORNIK CHEKHOSLOVATSKIKH KHIMICHESKIKH RABOT. Vol. 23, no. 1, Jan. 1958.

TUMA, H.; TIETZ, N. Photocolorimetric determination of zirconium by means of morin. In German. p. 142.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, no. 3, March, 1959. Uncl.

*Tuma, H*  
CZECHOSLOVAKIA / Chemical Technology. Chemical Prod- H  
ucts and Their Applications. Corrosion.  
Corrosion Control.

Abs Jour: Ref Zhur-Khimiya, No 9, 1959, 31574.

Author : Vyklicky, M., Pronosil, B., Tuma, H.

Inst : Not given.

Title : Oxidation of Fe-Al-C Alloys.

Orig Pub: Hutnicke listy, 1958, 13, No 6, 490-496.

Abstract: The results of studying the oxidation of Fe-Al-C alloys, with a different content of Al and C at a temperature range of 900-1500<sup>0</sup>, indicated that, after the initial uniform oxidation, some alloys subjected to analysis exhibited an anomalous (A) oxidation. In the A oxidation, blisters were formed on the surface of metals, due to the destruction of the initial protective film of ox-

Card 1/3

CZECHOSLOVAKIA / Chemical Technology. Chemical Prod- H  
ucts and Their Applications. Corrosion.  
Corrosion Control.

Abs Jour: Ref Zhur-Khimiya, No 9, 1959, 31674.

Abstract: idation. In places where the blisters took place, oxidation proceeded faster than in the parent metal. It was established that, in the A oxidation, the usual laws pertaining to the development of protective oxidized films do not apply. The duration of the initial uniform oxidation is reduced by a temperature rise, an increased content of C in the alloys and a decreased content of Al. The metallographic investigations of the parent metal under the oxidized film indicated that the destruction of the initially formed oxidized film is connected with volume changes resulting from the transformation of the  $\epsilon$ -phase into the  $\gamma$ -phase. However, the transformation

Card 2/3

CZECHOSLOVAKIA / Analytical Chemistry. Analysis of E-2  
Inorganic Substances.

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 27112.

Author : Tuma, H.

Inst : ~~Not given.~~

Title : The Separation of Carbides From Highly Alloyed  
Steels with Bromine.

Orig Pub: Hutnicke Listy, 13, No 8, 717-719 (1958) (in Czech).

Abstract: Optimum conditions for the separation of carbides from highly alloyed steels with bromine solutions have been investigated (10% solutions of bromine in water,  $\text{CH}_3\text{OH}$ , and methylacetate were used). The sample to be analyzed, containing 0.5 gm carbides, is treated with 100 ml of bromine solution, the resulting mixture is kept in a covered vessel at 15-18° for 24 hrs or heated to 50°, and filtered through

Card 1/4

79



CZECHOSLOVAKIA / Analytical Chemistry: Analysis of E-2  
Inorganic Substances!

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 27112.

Abstract: a porous glass filter. The residue is washed with water, ethanol, and ether (when the sample is treated initially with an aqueous bromine solution), methanol and ether (when a methanolic bromine solution is used) or with methylacetate (when a solution of bromine in methylacetate is used), dried at 50° in a vacuum dessicator, and weighed. In the analysis of various carbides ( $\text{Fe}_3\text{C}$ ,  $\text{Cr}_7\text{C}_3$ ,  $\text{Mo}_2\text{C}$ ,  $\text{VC}$ ,  $\text{WC}$ ,  $\text{TiC}$ ,  $\text{NbC}$ ) it was found that treatment with an aqueous bromine solution at 15° is satisfactory for the separation of  $\text{Fe}_3\text{C}$ ,  $\text{Cr}_7\text{C}_3$ ,  $\text{WC}$ ,  $\text{TiC}$ , and  $\text{NbC}$ ;  $\text{Mo}_2\text{C}$  and  $\text{VC}$  do not dissolve under these conditions. An increase in the temperature to 50° has a deleterious effect. A methanolic bromine solution has a strong solvating effect on the carbides

Card 2/4

CZECHOSLOVAKIA / Analytical Chemistry. Analysis of E-2  
Inorganic Substances.

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 27112.

Abstract: than an aqueous bromine solution:  $\text{Fe}_3\text{C}$  dissolves to the extent of 75% and WC, 12%. In the analysis of various steels containing, in particular, C, Cr, Ni, and Ti, or C, Cr, Ni, Ti, and W it was found that bromine solutions cannot be used to separate carbides from steels containing Mo and V, since the dissolution of the carbides of these metals leads to serious errors. Electrolytic separation methods are recommended for the analysis of Mo- and V-containing steels. Aqueous bromine solutions at 15° can be used in the separation of carbides from steels which do not contain Mo and V. Methanolic bromine solutions are not suited for the analysis of steels containing  $\text{Fe}_3\text{C}$ , Mo, V, or W and methyl-acetate bromine solutions cannot be used for the

Card 3/4

80

CZECHOSLOVAKIA / Analytical Chemistry. Analysis of E-2  
Inorganic Substances.

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 27112.

Author : Tuma, H.

Inst : Not given.

Title : The Separation of Carbides From Highly Alloyed  
Steels with Bromine.

Orig Pub: Hutnicke Listy, 13, No 8, 717-719 (1958) (in Czech).

Abstract: Optimum conditions for the separation of carbides from highly alloyed steels with bromine solutions have been investigated (10% solutions of bromine in water, CH<sub>3</sub>OH, and methylacetate were used). The sample to be analyzed, containing 0.5 gm carbides, is treated with 100 ml of bromine solution, the resulting mixture is kept in a covered vessel at 15-18° for 24 hrs or heated to 50°, and filtered through

Card 1/4

79

CZECHOSLOVAKIA / Analytical Chemistry. Analysis of E-2  
Inorganic Substances.

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 27112.

Abstract: than an aqueous bromine solution:  $\text{Fe}_3\text{C}$  dissolves to the extent of 75% and WC, 12%. In the analysis of various steels containing, in particular, C, Cr, Ni, and Ti, or C, Cr, Ni, Ti, and W it was found that bromine solutions cannot be used to separate carbides from steels containing Mo and V, since the dissolution of the carbides of these metals leads to serious errors. Electrolytic separation methods are recommended for the analysis of Mo- and V-containing steels. Aqueous bromine solutions at 15° can be used in the separation of carbides from steels which do not contain Mo and V. Methanolic bromine solutions are not suited for the analysis of steels containing  $\text{Fe}_3\text{C}$ , Mo, V, or W and methyl-acetate bromine solutions cannot be used for the

Card 3/4

60

CZECHOSLOVAKIA / Analytical Chemistry. Analysis of E-2  
Inorganic Substances.

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 27112.

Abstract: separation of carbides from steels of the type indicated [sic]. -- T. Levi

Card 4/4

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**FOR SUSCEPTIBILITY TO INFLUENZA: RECENTLY**

SECRET

NO REF SOV: 001

Card 1/1

LOBL, Karel; TUMA, Hanus; GROBNER, Pavel

Contribution to the kinetics of carbide segregation in the  
Cr18Ni9Ti austenitic steels. Hut listy 19 no.12:870-874  
D '64.

1. State Research Institute of Material and Technology, Prague.



27  
 Crystallization of technical alloys Fe-Al-C in the region of  
 solid solution. M. V. Viskochy and H. T. Tama.  
*Metallurgiya* 14, 118-27 (1959). By means of differential  
 thermal analysis and metallographical analysis the particular  
 part of the equil. diagram of tech. alloys Fe-Al-C contg.  
 16-30% Al was constructed. It was found that at the men-  
 tioned compn., the solid soln.  $\alpha$ , and in the presence of C the  
 phase  $\delta$ , graphite and  $Al_4C_3$  exist in the whole range of temps.  
 The results obtained were compared with some other work,  
 especially with that of Vogel and Mader (*C.A.* 30, 2154').  
 2) references. Petr Schneider

Distr: 4E20

✓ Differential thermal analysis for the study of alloy and metal constitutional diagrams. Hanuš Tůma and Miloslav Vyklický (Státní výzkumný ústav materiálu a technol., Prague). *Hutnické listy* 13, 1077-81(1958).—Possibilities of differential thermal analysis for metallic materials; and a description of app. and working conditions are given. It is thus possible to obtain valuable data concerning crystn. of alloys which have not been studied until now. The advantage of this method consists in the relatively small quantity of test material and in quick execution in a large temp. range.  
Petr. Schneider

7777  
1/1

2  
1

ACCESSION NR: AP4034555

2/0065/64/000/002/0138/0152

AUTHOR: Lobl, Karel, (Lebl, Karel); Tuma, Hannus (Tuma, Gamish)

TITLE: Precipitation and solution of carbide  $M_{23}C_6$  in type 18/9 low-carbon austenitic steels

SOURCE: Kovove materialy, no. 2, 1964, 138-152

TOPIC TAGS: low-carbon austenitic steel, carbide precipitation, activation energy, nucleation area, diffusion growth, isothermal roasting, plasticity retention, kinetic property, thermodynamic property

ABSTRACT: The advantages of low-carbon steel may be offset by the choice of wrong production methods and by keeping it too long at critical temperatures for the precipitation of carbides. The paper discusses the kinetics of precipitation of chromium carbide in two 40 kg batches of steel of type Cr18Ni9 (0.058% and 0.036% C), fairly stable toward phase sigma, when roasted isothermically for a long time at 400--1,000 C, and studies their behavior by direct electrolytic isolation in an alcoholic 5% hydrochloric-acid solution

Card 1/3

ACCESSION NR: AP4034555

and chemical analysis of the carbides. Special attention was paid to the processes in the areas of nucleation (up to 650C) and diffusion growth (650--760/770C) of these carbides and above 760 and 770C, respectively, where carbide  $M_{23}C_6$  was partially soluble in the two batches, taken from ordinary production in a basic induction furnace. The activation energy of the carbide reaction was found to be 32,000--38,000 cal/mol in the area of highest solubility; over 70,000 cal/mol in the area of pronounced diffusion growth; around 5,000 cal/mol in the nucleation area. The average chemical composition of  $M_{23}C_6$  is  $Cr_{19.8} Fe_{3.2} C_6$  for the state of equilibrium. In the nucleation area the precipitated carbide was substantially richer in iron, whereas in the diffusion-growth area the iron content declined due to the increased rate of diffusion of the chromium. The distribution of total carbon between austenite and carbides depends upon the carbon content above 770C; below this temperature, not only on the carbon content, but also on the time of isothermal roasting. The mechanical experiments with samples subjected

Card 2/3

ACCESSION NR: AP4034555

to isothermic strain for up to 10,000 hours showed that 18/9-type chromium steels with reduced carbon content retain considerable plasticity even after long roasting. The results of electrolytic isolation of the carbide phases are helpful in studying the kinetic and thermodynamic properties of carbide reactions. Orig. art. has: 10 figures and 4 tables.

ASSOCIATION: Statni vyzkumny ustav materialu a technologie, Prague  
(State Research Institute for Material and Technology)

SUBMITTED: 12Sep63

DATE ACQ: 11May64

ENCL: 00

SUB CODE: MM

NO REF SOV: 004

OTHER: 005

Card 3/3

**"APPROVED FOR RELEASE: 03/14/2001**

**CIA-RDP86-00513R001757420007-8**

**APPROVED FOR RELEASE: 03/14/2001**

**CIA-RDP86-00513R001757420007-8"**

18.1130

24114  
Z/034/61/000/008/001/005  
E073/E335

AUTHORS: Vyklický, Miloslav, L8bl, Karel, Kabrhel, Adolf,  
Tůma, Hanuš, Číhal, Vladimír and Pražák, Milan

TITLE: Influence of Molybdenum and Copper on the Properties  
of Stainless Chromium

PERIODICAL: Hutnické listy, 1961, No. 8, pp. 553 - 560

TEXT: According to data published in the literature  
(Ref. 2 - Copper in Cast Steel and Iron. Copper Development  
Association, London), high-alloy chromium steels containing  
2-3% Si and 1.5-2% Cu have a high resistance to alum  
and are extensively used in the food-processing industry.  
An increased C content in chromium steels reduces their resistance  
to corrosion, particularly after unsuitable heat-treatment. X  
However, low-carbon chromium steels cause difficulties in the  
manufacture of castings of complex shapes. Therefore, higher  
C contents are used and the unfavourable influence of the C  
content is compensated by adding Cu. Although the effect of  
Mo on chromium steels is known, the authors are not aware of  
any published information on the combined influence of Cu and Mo  
Card 1/8

24144

Influence of Molybdenum ....

Z/034/61/000/008/001/005  
E073/E335

on the properties of chromium steels. This is in spite of the fact that such steels are being manufactured, for instance - the Czech steel Poldi-AK1BC (chemical composition: 0.12% C, 0.50% Mn, 0.25% Si, 16.15% Cr, 0.20% Mo and 1.75% Cu) and the ferritic chromium steel for use in the chemical industry, containing 0.6-0.8% C, max. 0.7% Mn, max. 2% Si, 28.0 - 30.0% Cr, 2.0 - 2.5% Ni, 2.0 - 2.5% Mo and 2.0% Cu. The authors considered it interesting to investigate the influence of Cu and Mo on the properties of chromium steel and this paper contains the results of these investigations. A total of 11 heats was produced with chemical compositions varying between the following limits: C 0.6 - 0.11%; Cu 0 - 6.11%; Cr 14.58 - 26.6% and Mo 0 - 3.91%. The heats were produced in a 20-kg high-frequency furnace, using as a charge low-carbon steel, low-carbon ferrochromium, low-carbon ferromolybdenum and copper. Of the mechanical properties only the hardness was measured. In agreement with data published in the literature, heats with higher copper contents showed a higher hardness, both

Card 2/8



24114

Influence of Molybdenum ....

Z/034/61/000/008/001/005

E073/E335

in the as-cast and in the annealed states; metallographic tests showed that addition of Cu brought about pronounced structural changes. The corrosion tests were carried out in a number of corrosive media, subdivided into the following groups:

A. Media with free  $\text{SO}_2$

1.  $\text{H}_2\text{SO}_3$ ; 2%; 20 °C
2.  $\text{NaHSO}_3$ ; 5%; 20 °C

B. Organic oxides

3. lactic acid; 10%; 20 °C
4. oxalic acid; 10%; 80 °C
5. citric acid; 10%; 80 °C
6. tartaric acid; saturated solution; 80 °C
7. acetic acid; concentrated; 80 °C

X

Card 3/8

Influence of Molybdenum ....

24114  
Z/034/61/000/008/001/005  
E073/E335

C. Inorganic non-oxidizing acids

- 8. hydrochloric acid; 8%; 20 °C
- 9. phosphoric acid; 65%; 80 °C

D. Inorganic Oxidizing acids

- 10. nitric acid; 65%; 80 °C .

A detailed analysis allowed grouping the time dependence of the weight loss due to corrosion into three basic groups: linear dependence (in hydrochloric acid and, in some cases, also in nitric acid at 80 °C); parabolic dependence with steepness increasing with time (NaHSO<sub>3</sub> solution) and, finally,

corrosion rate decreasing with time and characterised by a curve which flattens out. The corrosion tests have shown that steel containing 25% Cr, 2% Mo and 2% Cu had the highest resistance to corrosion, which almost equalled the Czech steel ČSN 17241. This type of steel was not investigated in the group of the 17% chromium steels. In the latter steel, Card 4/8

241144

Z/034/61/000/008/001/005  
E073/E335

Influence of Molybdenum ....

Mo improved the resistance to corrosion in solutions with free  $SO_2$ , whilst Cu improved the resistance to corrosion in organic acids. On the basis of laboratory results, SONP Kladno produced two 50-kg heats in a high-frequency furnace with chemical compositions which proved the most favourable in the laboratory tests. The compositions of these heats (in %) were as follows:

Heat	C	Mn	Si	P	S	Cr	Mo	Cu
A 3829	0.13	0.53	0.37	0.019	0.021	15.52	2.05	2.01
B 3830	0.10	0.54	0.30	0.026	0.017	24.75	1.75	1.95 .

The ingots from both heats were forged into 250 x 600 x 20 mm blanks and then rolled down to 1 mm thick sheet. These hot-rolled sheets were then used in mechanical and corrosion tests and in weldability tests. The most favourable heat-treatment for these steels proved to be the following:

Card 5/8

24114

Z/034/61/000/008/001/005  
EO73/E335

Influence of Molybdenum ....

Heat A ... 800 °C/0.5 hrs/air

" B ... 900 °C/0.5 hrs/air.

The mechanical properties of thus heat-treated steels do not differ substantially from the properties of semiferritic steels containing 17% Cr (CSN 17041). After this heat-treatment, both heats proved satisfactory in double-bending tests; in Erichsen tests both heats achieved the value of 7.9 mm. Welding tests were carried out by arc-welding in an argon atmosphere; the weldability of Heat A was better than that of Heat B. Potentiostatic polarisation curves were determined to obtain information on the corrosion behaviour of the steels. The following conclusions were reached: Additions of 2% Mo and 2% Cu proved the most suitable. The resistance-to-corrosion of steels with 17% Cr, 2% Mo and 2% Cu is higher than the resistance-to-corrosion of the same type of steel without Mo and Cu. Very good results were obtained with steel containing 25% Cr and an addition of Mo and Cu which, for most corrosive


Card 6/8

Influence of Molybdenum ....

24111  
Z/034/61/000/008/001/005  
E073/E335

media, will have the same resistance-to-corrosion as the austenitic CrNi steel CSN 17241. According to the achieved results, the steel with the lower Cr content can be used for less aggressive corrosion media and in cases in which the steel CSN 17041 cannot be used owing to its lower resistance-to-corrosion or its poor weldability. Steel with a higher Cr content (Heat B) can be used as a substitute for the steel CSN 17241 but the plasticity and weldability of this material are not as good as those of steel CSN 17241.

There are 17 figures, 7 tables and 12 references: 6 Czech and 6 non-Czech. The four English-language references quoted are: Ref. 1 - Loring - Metals Handbook, pp. 462 - 465; Ref. 2 - (quoted in text); Ref. 3 - Saklatwalla - Dammler, Trans. Am. Soc. Steel. Treat. 15, 1929; Ref. 4 - Daniloff - The Alloys of Iron and Copper. New York and London, 1934.



Card 7/8

24144

Influence of Molybdenum ....

Z/034/61/000/008/001/005  
E073/E335

ASSOCIATIONS: Státní výzkumný ústav materiálu a technologie v  
Praze (State Research Institute for Materials  
and Technology, Prague)  
Státní výzkumný ústav ochrany materiálu  
G.V. Akimova v Praze (G.V. Akimov  
State Research Institute for the Protection of  
Materials, Prague)

SUBMITTED: November 28, 1960

Card 8/8

VYKLICKY, Miloslav; LOBL, Karel; KABRHEL, Adolf; TUMA, Hanus; CIHAL, Vladimír; PRAZAK, Milan

Effect of molybdenum and copper on the properties of chrome stainless steel. Hut listy 16 no.8:553-560 Ag. '61.

1. Statní výzkumný ústav materialu a technologie, Praha (for Vyklicky, Lobl, Kabrhel and Tuma). 2. Statní výzkumný ústav ochrany materialu G.V.Akimova, Praha (for Cihal and Prazak).

*TUMA HANUS*  
CZECHOSLOVAKIA/Analytical Chemistry - Analysis of Inorganic Substances.

E-2

Abs Jour : Ref Zhur - Khimiya, No 8, 1958, 24782

Author : Tuma Hanus, Tietz Narcis

Inet : -

Title : Photocolorimetric Determination of Zirconium by Means of Morin.

Orig Pub : Chem. listy, 1957, 51, No 4, 722-725; Collect. czechosl. chem. commun., 1958, 23, No 1, 142-146

Abstract : In an acid medium  $Zr^{4+}$  forms with morin (I) a soluble lake of lemon-yellow color which is suitable for photometric determination of Zr. Intensity of coloration of the lake in 0.4-0.7 N HCl does not depend on concentration of  $H^+$ , but at high temperature and prolonged standing it increases and reaches a maximum after 1 hour. With 0-0.5 mg Zr per 100 ml solution the law of Beer holds. I is used in the form of an 0.2% solution in  $CH_3OH$ ; 1 ml of this solution

Card 1/2



*TOMA HANUS*

CZECHOSLOVAKIA/Optics - Methods of Analysis

K-8

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 12019

Author : Toman Vaclav, Toma Hanus

Inst : Not Given

Title : Methods of Processing Spectral Photometric Measurements in Simultaneous Determination of Two or Several Components of One Solution

Orig Pub : Hutnicke listy, 1957, 12, No 7, 621-622

Abstract : The author indicates the advantages of simultaneous determination of two or several components (v, Ti, Mo, etc.) in a solution, compared with their separate determination. The method gives economy in chemicals and working time.

Card : 1/1

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APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001757420007-8"

CZECHOSLOVAKIA/Optics - Optical Methods of Analysis

K-8

Abs Jour : Ref Zhur - Fizika, No 12, 1958, No 28838

Author : Tuma H., Tietz N.

Inst : Not Given

Title : Photocolorimetric Determination of Zirconium with the Aid of  
Morin.

Orig Pub : Collect. czechosl. chem. communis, 1958, 23, No 1, 142-146

Abstract : Translation from Chem. listy, 1957, 51, 722

Card : 1/1

TIETZ, Narcis, inz.; TOMAN, Vaclav, inz.; TUMA, Hanus, inz.

The importance and effect of electrolytes in isolating  
carbides from steel. Hut listy 12 no.6:517-521 Je '57.

1. Vyzkumny ustav materialu a technologie, Praha.

"APPROVED FOR RELEASE: 03/14/2001

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APPROVED FOR RELEASE: 03/14/2001

CIA-RDP86-00513R001757420007-8"

CZECH/34-59-8-11/16

AUTHORS: Tuma, Hanuš, Engineer and Vyklický, Miloslav, Engineer

TITLE: Isolation of Structural Components in Fe-Al-C Alloys

PERIODICAL: Hutnické listy, 1959, Nr 8, pp 706-710

ABSTRACT: In the here described experiments for developing methods of isolating structural components in Fe-Al-C alloys the authors studied, in the first instance, the stability of the individual phases in various electrolytes, and the magnitudes of the potentials in the respective electrolytes and they verified the proposed method of isolation. In addition, the problem of isolation of the aluminium carbide  $Al_4C_3$  was solved. On the basis of these and practical tests, the authors propose electrolytic isolation of the  $\epsilon$ -phase in Fe-Al-C alloys in a 5% solution of citric acid with a 2.5% addition of sodium chloride and 0.5 N chlorhydric acid. During the process of isolation, the temperature should not exceed  $3^\circ C$ , the current density should not exceed  $0.02 A/cm^2$  of the specimen surface and the isolation time should be reduced to a minimum. A two-hour isolation is practically

Card1/2



Isolation of Structural Components in Fe-Al-C Alloys CZECH/34-59-8-11/16

adequate for the entire range of the chemical composition of specimens in which the sought structural components (primarily the  $\epsilon$ -phase) occur. For isolating the aluminium carbide  $Al_4C_3$ , which dissolves in water, an isolation method was evolved which was based on dissolving the metallic component of the alloy in a waterless solution of bromine in metal acetate. There are 8 figures, 5 tables and 5 references, of which 1 is English and 4 Czech.

ASSOCIATION: Státní výzkumny ústav materiálu a technologie, Praha  
(State Research Institute for Materials and Technology, Prague)

Card 2/2

✓

TUMA, J.

Soviet nephelometers for the study of aerosols. p. 301.

ZDRAVOTNI TECHNIKA A VZDUCHOTECHNIKA. (Ceskoslovenska akademie ved.  
Ceskoslovenska vedecka technicka spolecnost pro zdravotni techniku a  
vzduchotechniku) Praha, Czechoslovakia, Vol. 2, no. 6, 1959.

Monthly List of East European Accession (EEAI), LC Vol. 9, no. 2,  
Feb. 1960.

Uncl.

L 34915-66 EWP(t)/ETI IJP(c) JD

ACC NR: AP6026597

SOURCE CODE: CZ/0034/66/000/002/0129/0131

AUTHOR: Tuma, H.

ORG: SVUM, Prague

TITLE: Calculation of the amount and composition of phases after isolation of carbides from steels with substantial amounts of isolated material

SOURCE: <sup>✓</sup> Hutnicke listy, no. 2, 1966, 129-131

TOPIC TAGS: tool steel, bearing steel, carbide phase, metal analysis

ABSTRACT: The author describes a method which is suitable for the determination of the amount and analysis of the basic metal and the carbide phase in phase analyses of steels and alloys. Qualitative isolation of carbides, and their chemical analysis are sufficient for the determination when the content of one of the carbide forming elements in the basic metal material is also known. The method is applicable when the content of carbides is 5-10%; this occurs in tool and bearing steels, and in hard welding alloys. Orig. art. has: 7 formulas and 1 table. [JPRS: 34,779]

SUB CODE: 11 / SUBM DATE: none / ORIG REF: 005

Card 1/1 1195

TUMA, J.

New measurements of two-grade links. p. 44.

SLABORPROUDY OBZOR. Praha. Vol. 15, no. 1, Jan. 1954.

SOURCE: East European Accessions List (EEAL), IC, Vol. 5, no. 3, March 1956.

TUMA, J.

Improved Hungarian DR-50 dumper. p. 341.

Vol. 3, no. 10, Oct. 1954 (Mechanisace)  
INZENYRSKE STAVBY  
Praha, Czechoslovakia

So: Eastern European Accession Vol.5 No. 4 April 1956

TUMA, J.

Tractor-drawn scrapers. p. 119.

Dumpers and bulldozer. p. 123.

Vol. 3, no. 4, April 1954 (Mechanisace)

INZENYRSKE STAVBY

Praha, Czechoslovakia

So: Eastern European Accession Vol. 5 No. 4 April 1956

TUMA J. - Mechanisace, Vol. 3, No. 2. Feb. 1954

Improvement of bucket-type trench excavators.p 49

SO: Monthly List of East European Accessions, (EEAL),LC, Vol. 4, No. 9, Sept 1955 Uncl.

TUMA, J.

"The Improvement of Bucket Type Trenching Machines"  
Article Discusses Proposed Improvements in Sighting,  
Operation and Design."

SO: Mechanizac, Czechoslovakia, Vol 3, No 1,  
Jan 1954, (AF-617422, 12 Apr 1954)



TUMA, J.

TUMA, J. Methods of increasing the capacity of machinery for earthwork. p. 544.

Vol. 4, no. 6, 1955  
SOVETSKA VEDA: STAVEBNICTVI  
TECHNOLOGY  
Praha, Czechoslovakia

So: East European Accessions, Vol. 5, no. 5, May 1956

TUMA, J.

Increasing the efficiency of excavators by using the Soviet experiences. p.343

INZENRYŠKE STAVEBY. (Ministerstvo stavebnictví) Praha

Vol. 3, no. 8, Aug. 1955

East European Accessions List

Vol. 5 No. 1

Jan. 1956

TUMA, J.

New- Syrovatka-Krohnak hot-air unit. p. 305 (Mechanisace. Praha. Vol. 9, no. 9, Sept. 1954)

SO: Monthly List of East European Accessions, (EEAL), IC, Vol. 4, No. 6, June 1955, Uncl.

TUMA, J.

TUMA, J. A survey of the construction and the development of Soviet nuclear reactors. p. 878, Vol. 6, no. 6, 1956 SOVETSKA VEDA: STROJIRENSTVI  
Praha, Czechoslovakia

SOURCE: EAST EUROPEAN ACCESSIONS LIST (EEAL) VOL 6 NO 4 APRIL 1957